

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number
WO 2005/058944 A2

(51) International Patent Classification⁷: **C07K 7/00**

(21) International Application Number:
PCT/US2004/041639

(22) International Filing Date:
13 December 2004 (13.12.2004)

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
60/529,025 12 December 2003 (12.12.2003) US

(71) Applicant (for all designated States except US): **THE GOVERNMENT OF THE UNITED STATES, AS represented by THE SECRETARY OF THE DEPARTMENT OF HEALTH & HUMAN SERVICES [US/US]; National Institutes of Health, Office of Technology Transfer, 6011 Executive Boulevard, Suite 325, Rockville, MD 20852-3804 (US).**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERZOFSKY, Jay,**

A. [US/US]; 5908 Bradley Blvd., Bethesda, MD 20814-1107 (US). **PASTAN, Ira, H.** [US/US]; 11710 Beall Mountain Road, Potomac, MD 20854 (US). **TERABE, Masaki** [JP/US]; 7007 Clarendon Road, Bethesda, MD 20814 (US).

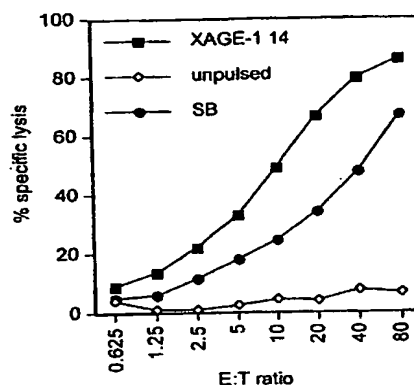
(74) Agents: **HYMAN, Laurence, J. et al.**; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, CA 94111-3834 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

[Continued on next page]

(54) Title: **IMMUNOGENIC PEPTIDES OF XAGE-1**



(57) **Abstract:** XAGE-1 is a gene expressed in a number of important human cancers, including prostate cancer, lung cancer, breast cancer, ovarian cancer, glioblastoma, pancreatic cancer, and melanoma. It has now been discovered that peptides of fifty or fewer amino acids comprising the sequence $X_1X_2X_3PSAPSPX_4$ (SEQ ID NO:5), where X_1 is any amino acid and is preferably G or Y; X_2 is selected from the group consisting of L, M, A, I, V, and T, with L and M being preferred; X_3 is a hydrophobic residue, M or A; and X_4 is V, M, L, A, I, or T, and is preferably V, bind to the HLA-A2 MHC class I molecule, and can be used to raise immune responses to XAGE-1-expressing cancers. In some embodiments, the P at position 7, the S at position 8, or the P at position 9, can be omitted to create a 9 amino acid peptide. The invention provides immunogenic peptides, nucleic acids encoding them, vectors comprising the nucleic acids, uses of the peptides and nucleic acids for manufacture of medicaments, methods of using the peptides and nucleic acids, and compositions of the peptides or nucleic acids in pharmaceutically acceptable carriers.

WO 2005/058944 A2